

Factors that Influence Your Susceptibility to EMF Damage

Researchers have found that there are a number of factors that influence the degree to which you may be affected by EMF's and other types of radiowaves. For example, according to the research by Dr. Dietrich Klinghardt, your physical body, such as your body weight, body-mass index, bone density, and water and electrolyte levels can alter the conductivity and biological reactivity to EMFs.

Heavy metals in your brain also act as micro-antennas, concentrating and increasing reception of EMF radiation. Likewise, any kind of metal implants and/or amalgam tooth fillings will significantly increase reception of microwaves, and the microcurrents from cell phones and other ambient fields.

This is yet another major reason for having your mercury fillings removed by a trained biological dentist.

Your genes can also play a part, as certain genes regulate metal detoxifying enzymes. So depending on your genetic makeup, you may be more or less predisposed to electromagnetic hypersensitivity.

People who suffer from diseases that causes myelin loss, such as muscular sclerosis, Lyme disease, and other autoimmune diseases are also at greater risk of electro-sensitivity.

Unfortunately, EMFs have been found to cause microorganisms to release higher amounts of potent toxins, which can exacerbate infections and autoimmune diseases.

Your overall risk is also dependent on other sources of EMF, such as the synergistic effect from geopathic earth radiation, metallic objects and furnishings in your home or office, electronic appliances, and household wiring.

Mechanism of Action

According to Dr. Andrew Goldsworthy retired from the Imperial College of London, acute electrohypersensitivity symptoms and diseases stemming from excessive non-thermal radiation exposure could potentially be explained by the effects on the cell wall.

Because as your body absorbs radiation, currents are created that weaken your cells' walls by removing calcium and other divalent ions.

This creates permeability, or "leakage" in your body, and this is known to happen even in non-thermal fields, and, interestingly, only in certain "amplitude windows." Low frequencies can be worse than high frequencies, and pulsed waves are worse than sine waves.

One of the most noticeable effects of this permeability in your body is the effect it can have on your brain function. As explained in the video, programmed flow of calcium ions through your cell membranes is a prerequisite for release of neurotransmitters.

“Unscheduled” leakage of calcium ions increases background calcium which makes membranes hypersensitive and more likely to transmit random signals.

The end result can be clouded mental activity. It can also activate random thoughts, which naturally makes it more difficult to concentrate.

Much of this effect is characteristic of ADHD...

Also, leakage of digestive enzymes from lysosomes can account for damage to DNA, and may offer yet another explanation for cancer rates and the rise in infertility. The resulting DNA fragmentation may also create genetic mutations that could appear in future generations.

Interestingly, and quite believably, the rise in microwave radiation and EMF exposure may be a significant contributing factor to the skyrocketing increase in autism, as electromagnetically induced membrane leakage leads to brain hyperactivity. A summary of a study conducted by Dr. Dietrich Klinghardt, MD, on the EMF level in the bedrooms of pregnant women whose children were autistic, versus EMF levels of mothers who had healthy children, can be found in the "Media Story Leads" section of www.ElectromagneticHealth.org. Body voltage levels in that location were also measured in the study.

The results suggest an urgent need for further research in the autism-EMF area, especially given the official number of children with autism was recently announced to be 1 in 91, compared to 1 in 150 in 2002.

More research is also needed on the mechanisms of action in general. A summary of all currently known mechanisms of action is expected to be published in 2010.

For example, in addition to Dr. Goldsworthy's theories discussed above, other possible mechanisms of action leading to symptoms and diseases include: increased free radical production, and impact on serotonin and melatonin.

In Defending Itself, Your Body Wears Itself Out...

The good news is that your body can, to a degree, defend itself from these types of radiation damage. It does so by pumping surplus calcium out of your cells, and by activating certain enzymes that protect your DNA, and by making heat shock proteins to protect enzymes.

The bad news is that in doing so, your body becomes fatigued, and the more it has to defend itself, the worse your health will fare. Eventually, it can start interfering with your

metabolism; impair your immune system; and lower your resistance to disease and cancer.

Last but not least, EMF exposures have a sensitizing effect, so you will become more and more sensitive over time.

How You Can Help Yourself

Fortunately, you are not completely helpless. There are strategies that can help reduce your exposure and protect your health against the constant onslaught of radiation.

First and foremost, you'll want to reduce your exposure to as many sources as you can.

For my latest list of safety tips and guidelines on how to reduce your exposure, please see this previous [article](#).

In addition to my recommendations, Camilla Rees mentions a few more in her video above, including:

- **Intestinal care** – mainly by making sure you're getting plenty of healthy probiotics. The Paracelsus Clinic in Switzerland discovered that symptoms of electrosensitivity can be reduced by providing gut barrier support. For more information, [listen to the interview with Dr. Rau](#), medical director of the Paracelsus Clinic, available at this [link](#).
- **Regular detoxification programs** – Reducing your toxic burden has become far more important than it ever was before. Not only are you dealing with increasing amounts of toxic chemicals in your environment, your body is full of microorganisms that respond to EMFs by generating increased levels of their own toxins, according to a course for physicians on this subject, taught by [Dr. Dietrich Klinghardt, MD](#).
- **Beware of mold** – Mold, just like other microorganisms, can also react in high EMF environments. One study showed 600 times more neurotoxins generated from mold in a high EMF environment. According to Rees, there are also mold legal cases being reviewed, assessing if problems in buildings infested with mold may have actually been related to nearby antenna infrastructure.

Human populations are increasingly exposed to microwave/radiofrequency (RF) emissions from wireless communication technology, including mobile phones and their base stations. By searching PubMed, we identified a total of 10 epidemiological studies that assessed for putative health effects of mobile phone base stations. Seven of these studies explored the association between base station proximity and neurobehavioral effects and three investigated cancer. We found that eight of the 10 studies reported increased prevalence of adverse neurobehavioral symptoms or cancer in populations living at distances < 500 meters from base stations. None of the studies reported exposure above accepted international guidelines, suggesting that current guidelines may be inadequate in protecting the health of human populations. We believe that comprehensive epidemiological studies of longterm mobile phone base station exposure are urgently required to more definitively understand its health impact. *Key words:* base stations; electromagnetic field (EMF); epidemiology; health effects; mobile phone; radiofrequency (RF); electromagnetic radiation.

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INTRODUCTION

Mobile phone base stations are now found ubiquitously in communities worldwide. They are frequently found near or on shops, homes, schools, daycare centers, and hospitals (Figure 1). The radiofrequency (RF) electromagnetic radiation from these base stations is regarded as being low power; however, their output is continuous. This raises the question as to whether the health of people residing or working in close proximity to base stations is at any risk.

METHODS

By searching PubMed and using keywords such as base station, mast, electromagnetic field (EMF), radiofrequency (RF), epidemiology, health effects, mobile phone, and cell phone, and by searching the references of primary sources, we were able to find only 10 human population studies from seven countries that examined the health effects of mobile phone base stations. Seven of the studies explored the association between base station proximity and neurobehavioral symptoms via population-based questionnaires; the other three retrospectively explored the association between base station proximity and cancer via medical

records. A meta-analysis based on this literature is not possible due to differences in study design, statistical measures/risk estimates, exposure categories, and endpoints/outcomes. The 10 studies are therefore summarized in chronological order (Table 1).

RESULTS AND DISCUSSION

We found epidemiological studies pertaining to the

TABLE 1 Summary of Epidemiological Studies of Mobile Phone Base Station Health Effects

Publication (Year; Country)	Clinical Assessment	Study Design	Base Station Details	Participants	EMF Measured	Key Findings	Strengths	Limitations
Navarro ² (2003; Spain)	Neuro-behavioral	Survey-questionnaire	GSM-DCS 1800 MHz	101	Yes	More symptoms with closer proximity to base station (< 150 m)	Detailed questionnaire, EMF measured, distances studied ^a	Low participation, self-estimated distances, subjects aware ^b
Santini ² (2003; France)	Neuro-behavioral	Survey-questionnaire	n/s	530	No	More symptoms with closer proximity to base station (< 300 m)	Detailed questionnaire, distances & other EMF exposures assessed	As above, plus no EMF measurements, no base station details
Eger ⁷ (2004; Germany)	Cancer Incidence	Retrospective case review	GSM 935 MHz	967	No	3 x risk of cancer after 5 yrs of exposure (< 400 m); early age of cancer diagnosis	Maximum beam intensity calculated, reliable cancer data collection	Other environmental risk factors not assessed; analysis not adjusted for age and sex
Wolf & Wolf ⁶ (2004; Israel)	Cancer Incidence	Retrospective case review	TDMA 850 MHz	1844	Yes	> 4 x risk of cancer after 3-7 yrs exposure (< 350 m); early age of cancer diagnosis	Reliable cancer & demographic data, no other major environmental pollutant identified	Not all environmental risk factors assessed; possible selection bias; no age, sex adjustment
Gadzicka ⁴ (2006; Poland)	Neuro-behavioral	Survey-questionnaire	n/s	500	No	More headache with proximity < 150 m; nocebo unlikely ^c	Detailed questionnaire, distances & EMF studied, nocebo studied	Subjects aware, no base station details
Hutter ⁵ (2006; Austria)	Neuro-behavioral	Cross-sectional	900 MHz	336	Yes	Headaches & impaired concentration at higher power density; nocebo unlikely	Detailed questionnaire and testing, EMF measured, distances studied; nocebo effect studied	Subjects aware, low participation rate
Meyer ⁹ (2006; Germany)	Cancer Incidence	Retrospective case review	n/s	177,428	No	No increased cancer incidence in municipalities with or without base stations	Wide population assessed (Bavaria)	Observation period only 2 years, vague definitions of exposure, exposure onset unknown, distance to base station unknown
Abdel-Rassoul ⁶ (2007; Egypt)	Neuro-behavioral	Cross-sectional	n/s	165	Yes	More symptoms & lower cognitive performance if living under or < 10 m from base station	Detailed questionnaire and testing, EMF measured, distances studied, subjects unaware	Exact base station details n/s, low number of participants
Blettner ¹⁰ (2009; Germany)	Neuro-behavioral	Cross-sectional	n/s	30,047	No	More health complaints closer to base station (< 500 m)	Wide population assessed, detailed survey, nocebo effect assessed	EMF measurements not carried out (see phase II in Berg-Beckhoff et al., 2009; below)
Berg-Beckhoff ¹¹ (2009; Germany)	Neuro-behavioral	Cross-sectional	GSM 900 MHz GSM 1800 MHz UMTS 1920-1980 MHz	1326	Yes	Health effects probably caused by stress and not by RF-EMF	Measured EMF emissions, standardized questionnaires	Low participation, no detailed list of symptoms published, single "spot" measurement in one place in dwelling, no occupational exposure assessed, time lag from assessment of symptoms and EMF measurement

n / s = not specified.

^a"Distance" refers to distance between base station and subjects' households.

^b"Subjects aware" refers to study participants being aware of the nature of the study.

^c"Nocebo" effect unlikely because the majority of subjects in the study reported little or no concern for base station proximity.

health effects of mobile phone base station RF emissions to be quite consistent in pointing to a possible adverse health impact. Eight of the 10 studies reported increased prevalence of adverse neurobehavioral symptoms or cancer in populations living at distances < 500 meters from base stations. The studies by Navarro et al.,² Santini et al.,³ Gadzicka et al.,⁴ and Hutter et al.⁵ reported differences in the distance-dependent prevalence of symptoms such as headache, impaired concentration, and irritability, while Abdel-Rassoul et al.⁶ also found lower cognitive performance in individuals living 8–10 meters from base stations compared with the more distant control group. The studies by Eger et al.⁷ and Wolf and Wolf⁸ reported increased incidence of cancer in persons living for several years < 400 meters from base stations. By contrast, the large retrospective study by Meyer et al.⁹ found no increased incidence of cancer near base stations in Bavaria. Blettner et al.¹⁰ reported in Phase 1 of their study that more health problems were found closer to base stations, but in Phase 2¹¹ concluded that measured EMF emissions were not related to adverse health effects (Table 1). Each of the 10 studies reviewed by us had various strengths and limitations as summarized in Table 1. Per-

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Epidemiological Evidence for a Health Risk
from Mobile Phone Base Stations

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Disclosures: The authors declare no conflicts of interest. taining to those base station studies in which EMF measurements were not carried out,^{3,4,7,9} it should be noted that distance is not the most suitable classifier for exposure to RF-EMF. Antennae numbers and configurations, as well as the absorption and reflection of their fields by

houses, trees, or other geographic hindrances may influence the exposure level. Further, self-estimation of distance to nearest base station is not the best predictor of exposure since the location of the closest base station is not always known. Such exposure misclassification inevitably biases any association towards null. Multiple testing might also produce spurious results if not adjusted for,^{3,5} as might failure to adjust for participant age and gender.⁷ Latency is also an important consideration in the context of cancer incidence following or during a putative environmental exposure. In this regard, the study by Meyer et al.⁹ found no association between mobile phone base station exposure and cancer incidence, but had a relatively limited observation period of only two years. On the other hand, the studies by Eger et al.⁷ and Wolf and Wolf⁸ found a significant association between mobile phone base station exposure and increased cancer incidence, although the approximate five-year latency between base station exposure and cancer diagnosis appears to be unexpectedly short in both of these studies.

Other problems in several population-based questionnaires are the potential for bias, especially selection⁸ and participation^{2,3,5,6,11} biases, and self-reporting of outcomes in combination with the exposure assessment methods used. For example, regarding limitations in exposure assessment, in a large two-phase base station study from Germany,^{12,13} of the Phase 1 participants (n = 30,047), only 1326 (4.4%) participated with a single “spot” EMF measurement recorded in the bedroom for Phase 2. Further, health effect contributions from all relevant EMF sources and other non-EMF environmental sources need to be taken into account.¹² We acknowledge that participant concern instead of exposure could be the triggering factor of adverse health effects, however this “nocebo effect” does not appear to fully explain the findings.^{4,5} Further, the biological relevance of the overall adverse findings (Table 1) is supported by the fact that some of the symptoms in these base-station studies have also been reported among mobile phone users, such as headaches, concentration difficulties, and sleep disorders.^{13,14} Finally, none of the studies that found adverse health effects of base stations reported RF exposures above accepted international guidelines, the implication being that if such findings continue to be reproduced, current exposure standards are inadequate

in protecting human populations.¹⁵

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Figure 1—Mobile phone base stations ("antennae" or "masts") in Australia. Upper left: Community shop roof showing plethora of flat panel antennae. Upper right: Hospital roof with flat panel antennae painted to blend in. Lower left: Top of a street light pole. Lower center: Mast erected next to a daycare center. Lower right: Antennae mounted on an office block top floor.

CONCLUSIONS

Despite variations in the design, size and quality of these studies as summarized in Table 1, it is the consistency of the base-station epidemiological literature from several countries that we find striking. In particular, the increased prevalence of adverse neurobehavioral symptoms or cancer in populations living at distances < 500 meters from base stations found in 80% of the available studies. It should be pointed out that the overall findings of health problems associated with base stations might be based on methodological weaknesses, especially since exposure to RF electromagnetic radiation was not always measured.

There are some proposed mechanisms via which low-intensity EMF might affect animal and human health,^{16,17} but full comprehensive mechanisms still remain to be determined.^{18,19} Despite this, the accumulating epidemiological literature pertaining to the health effects of mobile phones^{13,20} and their base stations (Table 1) suggests that previous exposure standards based on the thermal effects of EMF should no longer be regarded as tenable. In August 2007, an international working group of scientists, researchers, and public health policy professionals (the BioInitiative Working Group) released its report on EMF and health.²¹ It raised evidence-based concerns about the safety of existing public limits that regulate how much EMF is allowable from power lines, cellular phones, base stations, and many other sources of EMF exposure in daily life. The BioInitiative Report²¹ provided detailed scientific information on health impacts when people were exposed to electromagnetic radiation hundreds or even thousands of times below limits currently established by the FCC and International Commission for Non-Ionizing Radiation Protection in

Europe (ICNIRP). The authors reviewed more than 2000 scientific studies and reviews, and have concluded that: (1) the existing public safety limits are inadequate to protect public health; and (2) from a public health policy standpoint, new public safety limits and limits on further deployment of risky technologies are warranted based on the total weight of evidence.²¹ A precautionary limit of 1 mW/m² (0.1 microW/cm² or 0.614 V/m) was suggested in Section 17 of the BioInitiative Report to be adopted for outdoor, cumulative RF exposure.²¹ This limit is a cautious approximation based on the results of several human RF-EMF studies in which no substantial adverse effects on well being were found at low exposures akin to power densities of less than 0.5 – 1 mW/m².^{2,5,22–26} RF-EMF exposure at distances > 500 m from the types of mobile phone base stations reviewed herein should fall below the precautionary limit of 0.614 V/m.

References

1. Khurana VG, Teo C, Kundi M, Hardell L, Carlberg M. Cell phones and brain tumors: A review including the long-term epidemiologic data. *Surg Neurol.* 2009;72:205-214.
2. Navarro EA, Segura J, Portolés M, Gómez-Perretta C. The microwave syndrome: A preliminary study in Spain. *Electromag Biol Med.* 2003;22:161–169.
3. Santini R, Santini P, Le Ruz P, Danze JM, Seigne M. Survey study of people living in the vicinity of cellular phone base stations. *Electromag Biol Med.* 2003;22:41-49.
4. Gadzicka E, Bortkiewicz A, Zmyslony M, Szymczak W, Szyjowska A. Assessment of subjective complaints reported by people living near mobile phone base stations [Abstract]. *Biuletyn PTZE Warszawa.* 2006;14:23-26.
5. Hutter HP, Moshhammer H, Wallner P, Kundi M. Subjective symptoms, sleeping problems, and cognitive performance in subjects living near mobile phone base stations. *Occup Environ Med.* 2006;63:307-313.
6. Abdel-Rassoul G, El-Fateh OA, Salem MA, Michael A, Farahat F, El-Batanouny M, Salem E. Neurobehavioral effects among inhabitants around mobile phone base stations. *Neurotoxicology.* 2007;28:434-440.
7. Eger H, Hagen KU, Lucas B, Vogel P, Voit H. Einfluss der raumlichen nahe von mobilfunksendeanlagen auf die krebsinzidenz. [The influence of being physically near to a cell phone transmission mast on the incidence of cancer]. *Umwelt-Medizin-Gesellschaft.* 2004;17:326-332.

8. Wolf R, Wolf D. Increased incidence of cancer near a cell-phone transmitter station. *Int J Cancer Prev.* 2004;1:123-128.
9. Meyer M, Gartig-Daug A, Radespiel-Troger M. Cellular telephone relay stations and cancer incidence. *Umweltmed Forsch Prax.* 2006;11:89-97.
10. Blettner M, Schlehofer B, Breckenkamp J, Kowall B, Schmiedel S, Reis U, Potthoff P, Schüz J, Berg-Beckhoff G. Mobile phone base stations and adverse health effects: Phase 1 of a populationbased, cross-sectional study in Germany. *Occup Environ Med.* 2009;66:118-123.
11. Berg-Beckhoff G, Blettner M, Kowall B, Breckenkamp J, Schlehofer B, Schmiedel S, Bornkessel C, Reis U, Potthoff P, Schüz J. Mobile phone base stations and adverse health effects: Phase 2 of a cross-sectional study with measured radio frequency electromagnetic fields. *Occup Environ Med.* 2009; 66:124-130.
12. Neubauer G, Feychting M, Hamnerius Y, Kheifets L, Kuster N, Ruiz I, Schüz J, Uberbacher R, Wiart J, Rösli M. Feasibility of future epidemiological studies on possible health effects of mobile phone base stations. *Bioelectromagnetics.* 2007;28:224-230.
13. Khan MM. Adverse effects of excessive mobile phone use. *Int J Occup Environ Health.* 2008;21:289-293.
14. Söderqvist F, Carlberg M, Hardell L. Use of wireless telephones and self-reported health symptoms: A population-based study among Swedish adolescents aged 15-19 years. *Environ Health* 2008;7:18.
15. Hardell L, Sage C. Biological effects from electromagnetic field exposure and public exposure standards. *Biomed Pharmacother.* 2008;62:104-109.
16. Salford LG, Nittby H, Brun A, Grafström G, Malmgren L, Sommarin M, Eberhardt J, Widegren B, Persson BRR. The mammalian brain in the electromagnetic fields designed by man with special reference to blood-brain barrier function, neuronal damage and possible physical mechanisms. *Prog Theor Phys Suppl.* 2008;173:283-309.
17. Sheppard AR, Swicord ML, Balzano Q. Quantitative evaluations of mechanisms of radiofrequency interactions with biological molecules and processes. *Health Phys.* 2008;95:365-396.
18. Khurana VG. Cell phone and DNA story overlooked studies. *Science.* 2008;322:1325.
19. Yang Y, Jin X, Yan C, Tian Y, Tang J, Shen X. Case-only study of interactions between DNA repair genes (hMLH1, APEX1, MGMT, XRCC1 and XPD) and low-frequency electromagnetic fields in childhood acute leukemia. *Leuk Lymphoma.* 2008; 49:2344-2350.

20. Hardell L, Carlberg M, Soderqvist F, Hansson Mild K. Metaanalysis of long-term mobile phone users and the association with brain tumours. *Int J Oncol*. 2008;32:1097-1103.

21. Sage C, Carpenter D, eds. BioInitiative Report: A rationale for a biologically-based public exposure standard for electromagnetic fields (ELF and RF) [Internet]. 2007 [cited April 3, 2009]. Available from: <http://www.bioinitiative.org>.

22. Kundi M, Hutter HP. Mobile phone base stations - Effects on wellbeing and health. *Pathophysiol*. 2009;16:123-35.

23. Henrich S, Ossig A, Schlittmeier S, Hellbrück J. Elektromagnetische Felder einer UMTS-Mobilfunkbasisstation und mögliche Auswirkungen auf die Befindlichkeit—eine experimentelle Felduntersuchung [Electromagnetic fields of a UMTS mobile phone base station and possible effects on health – results from an experimental field study]. *Umwelt Med Forsch Prax*. 2007;12:171-180.

24. Thomas S, Kühnlein A, Heinrich S, Praml G, Nowak D, von Kries R, Radon K. Personal exposure to mobile phone frequencies and well-being in adults: A cross-sectional study based on dosimetry. *Bioelectromagnetics*. 2008;29:463-470.

25. Zwamborn APM, Vossen SHJA, van Leersum BJAM, Ouwens MA, Makel WN. Effects of global communication system radiofrequency fields on well being and cognitive functions of human subjects with and without subjective complaints. Organization for Applied Scientific Research (TNO), Physics and Electronics Laboratory: The Hague, Netherlands, 2003.

26. Regel SJ, Negovetic S, Rösli M, Berdinas V, Schuderer J, Huss A, Lott U, Kuster N, Achermann P. UMTS base station like exposure, well being and cognitive performance. *Environ Health Perspect*. 2006;114:1270-1275.

Is Electromagnetic harming our health?

Electrical pollution from cellphones and Wi-Fi may be hazardous

<http://www.msnbc.msn.com/id/34509513/ns/health-cancer//>

By Michael Sege

Prevention

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In 1990, the city of La Quinta, CA, proudly opened the doors of its sparkling new middle school. Gayle Cohen, then a sixth-grade teacher, recalls the sense of excitement everyone felt: "We had been in temporary facilities for 2 years, and the change was exhilarating."

But the glow soon dimmed.

One teacher developed vague symptoms — weakness, dizziness — and didn't return after the Christmas break. A couple of years later, another developed cancer and died; the teacher who took over his classroom was later diagnosed with throat cancer. More instructors continued to fall ill, and then, in 2003, on her 50th birthday, Cohen received her own bad news: breast cancer.

"That's when I sat down with another teacher, and we remarked on all the cancers we'd seen," she says. "We immediately thought of a dozen colleagues who had either gotten sick or passed away."

By 2005, 16 staffers among the 137 who'd worked at the new school had been diagnosed with 18 cancers, a ratio nearly 3 times the expected number. Nor were the children spared: About a dozen cancers have been detected so far among former students. A couple of them have died.

Prior to undergoing her first chemotherapy treatment, Cohen approached the school principal, who eventually went to district officials for an investigation. A local newspaper article about the possible disease cluster caught the attention of Sam Milham, MD, a widely traveled epidemiologist who has investigated hundreds of environmental and occupational illnesses and published dozens of peer-reviewed papers on his findings. For the past 30 years, he has trained much of his focus on the potential hazards of electromagnetic fields (EMFs) — the radiation that surrounds all electrical appliances and devices, power lines, and home wiring and is emitted by communications devices, including cellphones and radio, TV, and Wi-Fi.

transmitters.

His work has led him, along with an increasingly alarmed array of international scientists, to a controversial conclusion: The "electrosmog" that first began developing with the rollout of the electrical grid a century ago and now envelops every inhabitant of Earth is responsible for many of the diseases that maim – or kill – us.

Milham was especially interested in measuring the ambient levels of a particular kind of EMF, a relatively new suspected carcinogen known as high-frequency voltage transients, or "dirty electricity." Transients are largely byproducts of modern energy-efficient electronics and appliances – from computers, refrigerators, and plasma TVs to compact fluorescent light bulbs and dimmer switches – which tamp down the electricity they use. This manipulation of current creates a wildly fluctuating and potentially dangerous electromagnetic field that not only radiates into the immediate environment but also can back up along home or office wiring all the way to the utility, infecting every energy consumer in between.

With Cohen's help, Milham entered the school after hours one day to take readings. Astonishingly, in some classrooms he found the surges of transient pollution exceeded his meter's ability to gauge them. His preliminary findings prompted the teachers to file a complaint with the Occupational Safety and Health Administration, which in turn ordered a full investigation by the California Department of Health Care Services.

The final analysis, reported by Milham and his colleague, L. Lloyd Morgan, in 2008 in the American Journal of Industrial Medicine: Cumulative exposure to transients in the school increased the likelihood a teacher would develop cancer by 64%. A single year of working in the building raised risk by 21%. The teachers' chances of developing melanoma, thyroid cancer, and uterine cancer were particularly high, as great as 13 times the average. Although not included in the tabulations, the risks for young students were probably even greater.

"In the decades-long debate about whether EMFs are harmful," says Milham, "it looks like transients could be the smoking gun."

The case against EMFs

Cancer and electricity

Could a disease whose cause has boggled scientists be linked to perhaps the greatest practical discovery of the modern era? For 50 years, researchers who have tried to tie one to the other have been routinely

dismissed by a variety of skeptics, from congressional investigators to powerful interest groups — most prominently electric utilities, cellphone manufacturers, and Wireless providers, which have repeatedly cited their own data showing the linkage to be "weak and inconsistent."

Recently, however, in addition to the stunning new investigations into dirty electricity (which we'll return to), several developments have highlighted the growing hazards of EMF pollution — and the crucial need to address them.

The evidence showing harm is overwhelming

In 2007, the BioInitiative Working Group, an international collaboration of prestigious scientists and public health policy experts from the United States, Sweden, Denmark, Austria, and China, released a 650 page report citing more than 2,000 studies (many very recent) that detail the toxic effects of EMFs from all sources. Chronic exposure to even low-level radiation (like that from cellphones), the scientists concluded, can cause a variety of cancers, impair immunity, and contribute to Alzheimer's disease and dementia, heart disease, and many other ailments. "We now have a critical mass of evidence, and it gets stronger every day," says David Carpenter, MD, director of the Institute for Health and the Environment at the University at Albany and coauthor of the public health chapters of the BioInitiative report.

Fears about the hazards of cellphones seem justified

"Every single study of brain tumors that looks at 10 or more years of use shows an increased risk of brain cancer," says Cindy Sage, MA, coeditor of the report. A recent study from Sweden is particularly frightening, suggesting that if you started using a cellphone as a teen, you have a 5 times greater risk of brain cancer than those who started as an adult. The risk rises even more for people who use the phone on only one side of the head. While defenders of cellphone safety claim no scientist can explain why EMFs may be harmful in humans, a body of reliable and consistent animal research shows that electromagnetic fields, equal to those generated by mobile phones, open the blood-brain barrier, causing blood vessels to leak fluid into the brain and damage neurons. Ironically, that research (by renowned Swedish neuro-oncologist Leif G. Salford, MD, PhD) began with the goal of finding a way to deliver chemotherapy to brain tumors.

Other countries are revising exposure standards

Members of the European Union, which has led the way on EMF investigations, are moving quickly to protect their citizens, particularly children and pregnant women. In the past 2 years alone, France, Germany, and England have dismantled wireless networks in schools and public

libraries, and other countries are pressing to follow suit. Israel has banned the placement of cellular antennae on residences, and Russian officials have advised against cellphone use for children under 18.

Electrical hypersensitivity (EHS) is becoming more widespread

Symptoms of EHS, a recently identified condition, include fatigue, facial irritation (resembling rosacea), tinnitus, dizziness, and digestive disturbances, which occur after exposure to visual display units, mobile phones, Wi-Fi equipment, and commonplace appliances. Experts say up to 3% of all people are clinically hypersensitive, as many as one-third of us to a lesser degree.

Electrical pollution is increasing dramatically

"For the first time in our evolutionary history, we have generated an entire secondary, virtual, densely complex environment — an electromagnetic soup — that essentially overlaps the human nervous system," says Michael Persinger, PhD, a neuroscientist at Laurentian University who has studied the effects of EMFs on cancer cells. And it appears that, more than a century after Thomas Edison switched on his first light bulb, the health consequences of that continual overlap are just now beginning to be documented.

A history of harmful effects

Until Edison's harnessing of electricity, humans' only sources of EMF exposure were the earth's static magnetic field (which causes a compass needle to point north) and cosmic rays from the sun and outer space; over our long evolution, we've adapted to solar EMFs by developing protective pigment. "But we have no protection against other EMF frequencies," says Andrew Marino, PhD, JD, a pioneer in bioelectromagnetics who has done extensive EMF research and a professor in the department of orthopedic surgery at the Louisiana State Health Sciences Center. "How quickly can we adapt our biology to these new exposures? It's the most important environmental health question — and problem — of the 21st century."

Research into the hazards of EMFs has been extensive, controversial — and, at least at the outset, animated by political intrigue. A sampling:

The Russians first noticed during World War II that radar operators (radar operates using radio frequency waves) often came down with symptoms we now attribute to electrical hypersensitivity syndrome. In the 1960s, during the height of the Cold War, they secretly bombarded the US embassy in Moscow with microwave radiation (a higher-frequency RF used to transmit wireless signals), sickening American employees. Radio wave sickness — also called microwave sickness — is now a commonly accepted diagnosis.

When television (also radio wave) was introduced in Australia in 1956, researchers there documented a rapid increase in cancers among people who lived near transmission towers.

In the 1970s, Nancy Wertheimer, PhD, a Denver epidemiologist (since deceased), detected a spike in childhood leukemia (a rare disease) among kids who lived near electric power lines, prompting a rash of studies that arrived at similar conclusions.

In the 1980s, investigators concluded that office workers with high exposure to EMFs from electronics had higher incidences of melanoma — a disease most often associated with sun exposure — than outdoor workers.

In 1998, researchers with the National Cancer Institute reported that childhood leukemia risks were "significantly elevated" in children whose mothers used electric blankets during pregnancy and in children who used hair dryers, video machines in arcades, and video games connected to TVs.

Over the past few years, investigators have examined cancer clusters on Cape Cod, which has a huge US Air Force radar array called PAVE PAWS, and Nantucket, home to a powerful Loran-C antenna. Counties in both areas have the highest incidences of all cancers in the entire state of Massachusetts.

More recently, the new findings on transients — particularly those crawling along utility wiring — are causing some scientists to rethink that part of the EMF debate pertaining to the hazards of power lines. Could they have been focusing on the wrong part of the EMF spectrum?

Transients: the postmodern carcinogen

Some earlier, notable — albeit aborted — research suggests this may be the case. In 1988, Hydro-Québec, a Canadian electric utility, contracted researchers from McGill University to study the health effects of power line EMFs on its employees. Gilles Thériault, MD, DrPH, who led the research and was chair of the department of occupational health at the university, decided to expand his focus to include high-frequency transients and found, even after controlling for smoking, that workers exposed to them had up to a 15-fold risk of developing lung cancer. After the results were published in the American Journal of Epidemiology, the utility decided to put an end to the study.

That research commenced at a time when energy-efficient devices — the major generators of transients — were beginning to saturate North

American homes and clutter up power lines. A telltale sign of an energy-efficient device is the ballast, or transformer, that you see near the end of a power cord on a laptop computer, printer, or cellphone charger (although not all devices have them). When plugged in, it's warm to the touch, an indication that it's tampering down current and throwing off transient pollution. Two of the worst creators of transient radiation: light dimmer switches and compact fluorescent light bulbs (CFLs). Transients are created when current is repeatedly interrupted. A CFL, for instance, saves energy by turning itself on and off repeatedly, as many as 100,000 times per second.

So how does the human body respond to this pulsing radiation? "Think of a magnet," explains Dave Stetzer, an electrical engineer and power supply expert in Blair, WI. "Opposite charges attract, and like charges repel. When a transient is going positive, the negatively charged electrons in your body move toward that positive charge. When the transient flips to negative, the body's electrons are pushed back. Remember, these positive-negative shifts are occurring many thousands of times per second, so the electrons in your body are oscillating to that tune. Your body becomes charged up because you're basically coupled to the transient's electric field."

Keep in mind that all the cells in your body, whether islets in the pancreas awaiting a signal to manufacture insulin or white blood cells speeding to the site of an injury, use electricity— or "electron change"— to communicate with each other. By overlapping the body's signaling mechanisms, could transients interfere with the secretion of insulin, drown out the call-and-response of the immune system, and cause other physical havoc?

Some preliminary research implies the answer is yes. Over the past 3 years, Magda Havas, PhD, a researcher in the department of environmental and resource studies at Trent University in Ontario, has published several studies that suggest exposure to transients may elevate blood sugar levels among people with diabetes and prediabetes and that people with multiple sclerosis improve their balance and have fewer tremors after just a few days in a transient-free environment. Her work also shows that after schools installed filters to clean up transients, two-thirds of teachers reported improvement in symptoms that had been plaguing them, including headache, dry eye, facial flushing, asthma, skin irritation, and depression.

Transients are particularly insidious because they accumulate and strengthen, their frequency reaching into the dangerous RF range. Because they travel along home and utility wiring, your neighbor's energy

choices will affect the electrical pollution in your house. In other words, a CFL illuminating a porch down the block can send nasty transients into your bedroom.

Something else is sending transients into your home: the earth. From your high school science texts, you know that electricity must travel along a complete circuit, always returning to its source (the utility) along a neutral wire. In the early 1990s, says Stetzer, as transients began overloading utility wiring, public service commissions in many states told utilities to drive neutral rods into the ground on every existing pole and every new one they erected. "Today, more than 70% of all current going out on the wires returns to substations via the earth," says Stetzer — encountering along the way all sorts of subterranean conductors, such as water, sewer, and natural gas pipes, that ferry even more electrical pollution into your home.

A pragmatic proposal

Of course, these small studies — from Miami, Hydro-Québec, and Havas — hardly constitute a blanket indictment of transients. "We're still early in this part of the EMF story," says Carpenter. Does that mean as evidence of their harm accumulates, officials will raise a red flag? Not likely, if past EMF debates are any indication. Power companies have successfully beaten back attempts to modify exposure standards, and the cellphone industry, which has funded at least 87% of the research on the subject, has effectively resisted regulation. One good reason has had to do with latency — how long it takes to develop a particular cancer, often 25 years or more. Cellphones have been around only about that long.

But does that mean we avoid any discussion of their possible dangers? Again, if the past is a guide, the answer appears to be "probably." American scientists worried about the hazards of smoking, the DES (diethylstilbestrol) pill (given to pregnant women, it caused birth defects), asbestos, PCBs (polychlorinated biphenyls) — the list is lengthy — but officially warned about exposure only after they could say with absolute certainty that these things were harmful. As for protecting ourselves from toxic radiation, we have a lax — and laughable — history. In the 1920s, just a few years after medical imaging devices were invented, physicians were known to entertain their guests by X-raying them at garden parties. In the 1930s, scientists often kept radium in open trays on their desks. Shoe stores used X-ray machines in the 1940s to properly fit children's feet, and radioactive wristwatches with glowing hour hands were popular in the 1950s.

All of which means that, absent prudent safety standards from both public officials and manufacturers (adding a protective filter would add 5 cents to

the cost of making a CFL and \$5 to the cost of a laptop), you'll have to protect yourself from EMFs. Here's a reasonable proposition: Practice what is known in Europe as the precautionary principle, which is pretty much what it sounds like. Don't expose yourself unnecessarily to EMF hazards. Don't buy a home next to a Wi-Fi tower. Get a corded telephone instead of a cordless one. Don't let your teenager sleep with a cellphone under her pillow. Don't use your laptop computer in your lap. Treat your EMF-emitting devices with the same cautious respect you do other invaluable modern devices, like your car, which is also dangerous — and can kill. You don't drive in an unnecessarily risky fashion — at high speed or while taking on a cellphone (right?).

The sad truth is that until we have more epidemiologic evidence — whether from disease clusters like the ones at La Quinta and on Cape Cod or from long-term analyses of the health of the world's 4 billion-and-growing cellphone users — we won't know definitively whether electrical pollution is harming us. And even then, we are unlikely to know why or how. "In this country, our research dollars are spent on finding ways to treat disease, not on what causes it — which is to say, how we can prevent it," says Marino. "And that's a tragedy."

But that's also another story.

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URL: <http://www.msnbc.msn.com/id/34509513/ns/health-cancer/>

Effects of Cell Phone Radiofrequency Signal Exposure on Brain Glucose Metabolism

Preliminary Communication

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Abstract

Context The dramatic increase in use of cellular telephones has generated concern about possible negative effects of radiofrequency signals delivered to the brain. However, whether acute cell phone exposure affects the human brain is unclear.

Objective To evaluate if acute cell phone exposure affects brain glucose metabolism, a marker of brain activity.

Design, Setting, and Participants Randomized crossover study conducted between January 1 and December 31, 2009, at a single US laboratory among 47 healthy participants recruited from the community. Cell phones were placed on the left and right ears and positron emission tomography with (^{18}F)fluorodeoxyglucose injection was used to measure brain glucose metabolism twice, once with the right cell phone activated (sound muted) for 50 minutes (“on” condition) and once with both cell phones deactivated (“off” condition). Statistical parametric mapping was used to compare metabolism between on and off conditions using paired *t* tests, and Pearson linear correlations were used to verify the association of metabolism and estimated amplitude of radiofrequency-modulated electromagnetic waves emitted by the cell phone. Clusters with at least 1000 voxels (volume $>8\text{ cm}^3$) and $P < .05$ (corrected for multiple comparisons) were considered significant.

Main Outcome Measure Brain glucose metabolism computed as absolute metabolism ($\mu\text{mol}/100\text{ g per minute}$) and as normalized metabolism (region/whole brain).

Results Whole-brain metabolism did not differ between on and off conditions. In contrast, metabolism in the region closest to the antenna (orbitofrontal cortex and temporal pole) was significantly higher for on than off conditions (35.7 vs 33.3 $\mu\text{mol}/100\text{ g per minute}$; mean difference, 2.4 [95% confidence interval, 0.67-4.2]; $P = .004$). The increases were significantly correlated with the estimated electromagnetic field amplitudes both for absolute metabolism ($R = 0.95$, $P < .001$) and normalized metabolism ($R = 0.89$; $P < .001$).

Conclusions In healthy participants and compared with no exposure, 50-minute cell phone exposure was associated with increased brain glucose metabolism in the region closest to the antenna. This finding is of unknown clinical significance.

More data on EMF/cell phones from a friend, one of the authors of *Public Health SOS: The Shadow Side of the Wireless Revolution*.

A scientific study published in the journal *Neurotoxicology* finds that people who live around mobile phone base stations (cell towers) are at risk for developing neuropsychiatric problems and changes in neurobehavioral function.

The prevalence of neuropsychiatric complaints as headache (23.5%), memory changes (28.2%), dizziness (18.8%), tremors (9.4%), depressive symptoms (21.7%), and sleep disturbance (23.5%) were significantly higher among exposed inhabitants than controls: (10%), (5%), (5%), (0%), (8.8%) and (10%), respectively ($P < 0.05$). Exposed inhabitants exhibited a significantly lower performance than controls in one of the tests of attention and short-term auditory memory.

The authors say revision of standard guidelines for public exposure to RER from mobile phone base station antennas around the stations is recommended.

G. Abdel-Rassoul *, O. Abou El-Fateh, M. Abou Salem, A. Michael, F. Farahat, M. El-Batanouny, E. Salem. Neurobehavioral effects among inhabitants around mobile phone base stations. *NeuroToxicology* 28 (2007) 434–440

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Subject: Cell Phones More Dangerous Than Cigarettes and Asbestos

From: NewsMax Media <newsmax@newsmax.sparklist.com>

1. Cell Phones More Dangerous Than Cigarettes and Asbestos

A top Australian neurosurgeon says cell phones may cause more cancer in the near future than smoking or asbestos. Dr. Vini Khurana, who conducted an extensive review of the link between cell phones and brain cancer said using cell phones for at least ten years could more than double the risk of developing deadly brain cancer. Since three times as many people use cell phones as smoke, cell phones will soon emerge as a major killer.

"It is anticipated that this danger has far broader public health ramifications than asbestos and smoking, and directly concerns all of us, particularly the younger generation, including very young children," Dr. Khurana wrote.

Dr. Khurana says there has been an increase in brain tumors in people who have used cell phones heavily for a long time on the same side of the head as their "preferred ear" for making calls. He believes it has been difficult to prove a direct link between cell phone usage and brain tumors because a malignant brain tumor might take between ten and twenty years to develop, and the general public hasn't been using cell phones long enough to effectively study the risk.

That will soon change. "In the years 2008-2012, we will have reached the appropriate length of follow-up time to being to definitely observe the impact of this global technology on brain tumor incidence rates," Khurana says.

Editor's Note:

CELL PHONE HAZARDS - THE EVIDENCE IS IN

By William Thomas

The evidence is in - and it is overwhelming. Even at typical low power, cell phones and wireless technology cause severe biological disturbances in human cells. In August 2007, 26 medical and public health experts their Bioinitiative Report - available online - reviewing all the literature on the effects of electromagnetic radiation

Cell phone researchers not in the pay of mobile phone corporations agree on three things:

1. Current guidelines based only on the heating effects of cell phones do not address non-heating damage to DNA, nor the effects of frequency modulation used to broadcast information and are completely inadequate to safeguard public health. Specific Absorption Rate (SAR) is should not be used as a basis for a safety standard since it regulates against thermal effects only.

So far cell phone "safety codes" only regulate radiation capable of burning skin. It's like saying cigarettes aren't dangerous unless they burn you.

Cell phone manufacturers insist that "many studies" show their miniature microwave ovens are safe. But when pressed by the *Washington Post* to back up their claim, the cellphone industry could cite no studies showing no adverse impact from cellular telephones on human tissues, nervous systems or organs.

Dr. George Carlo confirms: "The industry had come out and said that there were thousands of studies that proved that wireless phones are safe, and the fact was that there were no studies that were directly relevant."

There are more than 15,000 scientific studies reporting the cell phone health hazards. At least 66 epidemiological studies show that electromagnetic radiation increases brain tumors in human populations. ["Cell Phone Convenience or 21st Century Plague?" by Dr. Nick Begich and James Roderick earthpulse.com]

A TWO-MINUTE CALL

After only two minutes of cellphone exposure, the blood-brain barrier fails, allowing proteins to enter the brain that can cause nerve damage. "Molecules such as proteins and toxins can pass out of the blood, while the phone is switched on, and enter the brain. We need to bear in mind diseases such as MS and Alzheimer's are linked to proteins being found in the brain." So, adds Leif Salford of Lund University in Sweden, is Parkinson's disease. [Electronics Australia Magazine Feb/00]



STRESS PROTEINS

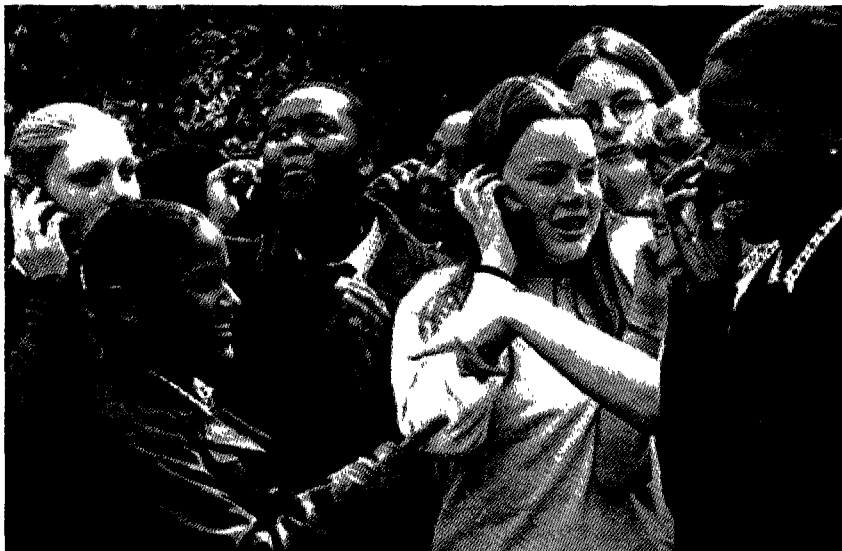
Cell phone and cell phone tower radiation stress our cells, releasing DNA-damaging free radicals and stress proteins that can migrate through the opened blood-brain barrier and cause degenerative damage in the brain. Dr. Theodore Litovitz, a biophysicist and professor emeritus of physics at Catholic University, explains: "Because stress proteins are involved in the progression of a number of diseases, heavy daily cell-phone usage could lead to great incidence of disorders such as Alzheimer's and cancer." [Reuters Apr 23/08; wirelessconsumers.org Dec03/01]

2. Children through teenage years, and pregnant women should be kept away from cell phones and cell phone radiation.

Alarmed British military scientists have discovered that *every* cell phone transmission disrupts brain functioning responsible for memory and learning. "Overuse" can cause forgetfulness and sudden confusion, as well as loss of the ability to concentrate, calculate and coordinate.

Children and teens who become hooked on cell phones face a lifetime of learning disabilities, hyperactivity, high risk from driving accidents, greatly increased acute and chronic asthma, hearing loss, vision loss, sleep disorders and cancers - as well as loss of social skills, inability to think and reason clearly, loss of contact with their surroundings. [India Tribune Sept 17/04]

More than 2 billion people - including at least 500 million children - are using cell phones.



At least 87% of 11- to 16-year-olds own cell phones. In the USA, one in three teenagers uses a cell phone. RF/MW signals currently under discussion for inflicting on wireless classrooms throughout North America and the overdeveloped world will operate in the 2.4 GHz frequency range - *two to three times higher than current cell phones*. Plans are already underway to boost classroom radiation levels with "upgraded" technology emitting 5 GHz. [Uncensored (NZ) Nov 9/06; irf.univie.ac.at]

These kids may be difficult to replace, because researchers at University of Szeged in Hungary have discovered that men carrying their cell phones on standby anywhere in their clothing throughout the day produce about a third less sperm than those who do not. Of the remaining sperm, high numbers were found to be swimming erratically - significantly reducing chances of fertilization. [BBC June 27/04]

Put men made infertile by their cell phones together with fashionable beach going women who carry their

cellphones in their bikini bottoms and... We could be looking at an inadvertent cell phone cull. Especially if women are culled by bra-makers encouraging them to carry cell phones in their convenient, already cancer-prone cleavage.

The Spanish Neuro Diagnostic Research Institute in Marbella has found that a call lasting just two minutes can alter the natural electrical activity of a child's brain for up to an hour afterwards. Spanish doctors now fear that disturbed brain activity in children will lead to impaired learning ability, as well as psychiatric and behavioural problems.

Brain scans allowed Dr. Michael Klieseisen's team to see what is happening to the brains of cell phone users. "We never expected to see this continuing activity in the brain," he told the European press in new stories blacked out in the U.S.

Dr. Gerald Hyland finds the results "extremely disturbing." Parents who believe they are enhancing their children's safety and social standing by sending them back to school with cellphones could be impairing their health and ability to learn, Dr. Hyland warns. "The results show that children's brains are affected for long periods even after very short-term use. Their brain wave patterns are abnormal and stay like that for a long period. This could affect their mood and ability to learn in the classroom if they have been using a phone during break time, for instance."

These same altered brain waves "could lead to things like a lack of concentration, memory loss, inability to learn and aggressive behaviour. My advice would be to avoid mobiles." [Mirror Dec 26/01]

Led by Sir William Stewart, the famous British biochemist and president of the British Association for the Advancement of Science biomedical specialists, the Stewart Inquiry report on "Mobile Phones and Health" was released in April 2000. Sir William said he would not allow his grandchildren to use mobile phones. [Journal of the Australasian College of Nutritional & Environmental Medicine Sept /01]

In Sweden cell phones are being marketed to 5-year-olds. Olle Johansson, Associate Professor of Neuroscience at the Karolinska Institute in Stockholm declares: "Parents should take their children away from that technology." [*Dialing Our Cells* by William Thomas]

The Australian government's Commonwealth Scientific and Industrial Research Organisation (CSIRO) described laboratory tests as far back December 1974 showing neurons in the soft skulls of developing fetuses are extremely sensitive to heat during the process of cell division. "The mother's pelvic structure promotes deep RF radiation penetration within the developing embryo or fetus," Dr. Barnett warned. The womb's saline fluid is also highly conductive to Radio Frequencies and microwaves - and the EMF-conductive human body is 65% water-by-weight. Brain functioning may be impaired for life. [CSIRO June 1994; irf.univie.ac.at/emf; EMFacts Consultancy Mar 26/03]

The age of cell phone users continues to drop as fast as their IQ and attention span. In 2007, the average age of first-time "users" was 10. By next year, International Data Corp forecasts the 9-*and-under* market will rack up an additional \$1.6 billion in revenue for cell phone companies - and add another *nine million child zombies* in the United States alone.

According to a Eurobarometer survey of children in 29 countries, most had cellphones after age 9. "We're pretty bullish on increased usage by teenagers," exudes Adam Guy, a senior analyst at the Strategist Group. "Usage penetration is exploding."

Four in 10 people, particularly young adults, make cell phone calls to kill time as well as themselves. [London Telegraph Oct 9/07]

Professor Mild, of Orbero University, Sweden is a Government adviser who led the research says children should not be allowed to use mobile phones. He and others want a revision of the emission standard for mobiles and other sources of radiation, which they describe as "inappropriate" and "not safe". [London Telegraph Oct 9/07]

Dr. Salford says brain neurons that would normally not become senile until people reached their 60's, are doing so now when people reach their 30's because of cell phone exposure. [RFSafe.com Nov26/03]

Cellular One's slogan - "Wherever you go, there we are" - takes on ominous overtones as uninformed people are buying cellphones worldwide at the rate of 25 thousand a day and succumb to PR campaigns like the one that shows a picture of a crib and bears the legend: "No Member of the Family Should Be Without One..." [Independent Mar 30/08]

BEYOND CANCER

It's not just cancer that makes cell phones so dangerous. Lloyd's of London refuses to insure phone manufacturers against the risk of subscribers developing cancer - and early onset Alzheimer's. [Observer Mar11/99]

"Cumulative DNA damage in nerve cells of the brain can lead to Alzheimer's, Huntington's, and Parkinson's diseases." One type of brain cell can become cancerous from these double-strand DNA breaks at lower than the current Specific Absorption Rate exposure-standard (4 watts/kg).

It is not the total energy associated with the EMF that is critical, but rather pulsed oscillations. Many repetitions at the higher frequency close to subtle natural rhythms cause non-thermal threshold to be reached in a shorter time. This makes cellular processes "unusually sensitive to non-thermal ELF frequency fields."

Dr. Henry Lai, a 20-year EMF researcher, and colleague Dr. N.P. Singh confirmed double-strand DNA breaks in test animals exposed for just *two hours* to pulsed, cell phone microwaves. When you talk on your mobile phone at 800 MHz and 1,990 MHz, whipping anything back-and-forth 800 or 1,990 *million times per second* is bound to cause breakage in the double-strand DNA of human cells. [guardian.co.uk]

EM engineer Alasdair Philips of Britain's Powerwatch looked for people under age 40 using cell phones more than four hours a day, and found them already retired as "unfit for future work" due to early onset dementia. [EMFacts Consultancy Mar 26/03]

3. The risk of contracting cancer from cell phones is about 4% of more than 2 billion users - 80 million people and rising at 25,000 new "users" every day. The risk of premature senility and contracting Alzheimer's is extreme. Most kids brought up using cell phones will be functionally senile by the time they are 30.

You only need 2000 hours on a cell - OR A CORDLESS - phone to qualify for a 2 to 4x increased likelihood of a brain (glioma) or ear (acoustic neuroma) tumor.

On a New Zealand news show, Dr. George Carlo called marketing strategies aimed at children, "grotesque" after identifying as many as 50,000 new cases of brain and eye cancer attributable to cell phone use being diagnosed *every year*. (Mobile users who wear metal-frame glasses intensify the exposure to their eyes and heads). Based on current epidemiological studies, that number will reach half a million cell phone cancer cases *annually* within the next two years. [IsraCast Technology News July 29/05]

After heading a \$28 million cell phone study from 1993 through 2001, Dr. Carlos' finding "that RF causes genetic damage" was not welcomed by his cell phone industry sponsors. Ross Adey worked on similar research funded by Motorola in 1991. After he came to similar conclusions, Motorola was adamant that Adey never mention DNA damage and radiofrequency radiation in the same breath. [WSW July 11/02; wirelessconsumers.org Dec03/01]

Cellphones can cause cellular changes, brain damage

OSLUNDEN A study by scientists in Finland has found that mobile phone radiation can cause changes in human cells that might affect the brain, the leader of the research team said on Wednesday.

But Dr. David Lennarz, who headed the two-year study and will present findings this week at a conference in London, said more research was needed to determine the importance of the changes and their impact on the brain or the body.

The study at Finland's Radiation and Nuclear Safety Authority (STUK) found that exposure to radiation from mobile phones can cause increased activity in hundreds of genes in human cells grown in a laboratory, he said.

"We know that there is some biological response. We can detect it with our very sensitive approaches, but we do not know whether it can have any physiological effects on the human brain or human body," Lennarz said.

Meanwhile, the study, the second findings of which were published last month in the scientific journal *Environmental Health Perspectives*, raises new questions about whether mobile phone radiation can weaken the brain's protective shield against harmful substances.

The study focused on changes in cells that line blood vessels and on whether such changes could weaken the functioning of the blood-brain barrier, which prevents potentially harmful substances from entering the brain from the blood stream, Lennarz said.

The study found that a protein called "tight" linked to the functioning of the blood-brain barrier showed increased activity due to irradiation and pointed to a possibility that such activity could make the shield more permeable, he said.

"Increased genetic activity might mean cells in blood vessels are the



DANGEROUS ... a study has found that exposure to radiation from mobile phones can cause increased activity in hundreds of genes in human cells. - AP Photo

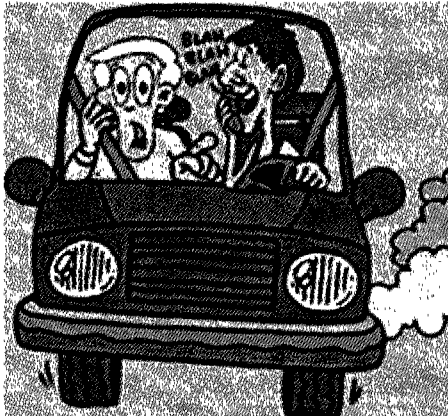
cells themselves - and then they also could appear between those cells through which some molecules could pass," he said.

Lennarz said he did not speculate on what level of health risk that could pose, but said a French study indicated that headache, fatigue and sleep disorders could result.

"There are not life-threatening problems but even there is a lot of discomfort," he said, adding that a Swedish group had also suggested a possible link with Alzheimer's disease.

"I think the truth is I do not know," he said.

Lennarz said that his, his wife and children use mobile phones and he said that he did not think his study suggested any need for new restrictions on mobile phone use.



DRIVE TIME

Stunned by an additional \$4 billion a year in claims for drivers using cell phones, North American insurers discovered that juggling phones while driving is *not* causing a 600% increase in accidents. Cell phones are much worse than merely dangerous driving distractions. Tests conducted by the U.S. Department of Energy found that using a cellphone severely impairs a driver's memory and reaction times by disrupting signals to and within the brain. Hands-free mobile phones cause even more crashes because they typically emit *10-times* more brainwave interference than handheld units.

Phoning from inside a car or truck is a bad call for everyone in the vehicle - especially children - because the surrounding steel structure amplifies cellphone emissions "by up to *10-fold*," the UK House of Commons Science and Technology Committee reports.

University of Toronto investigators report that the heightened probability of cracking up your car persists for up to a half-hour *after* completing a call.

"That's comparable to the risk of crashing while driving dead drunk," exclaims Dr. Chris Runball, chairman of the B.C. Medical Association's emergency medical services committee. Motorists talking on cell phones are actually *more impaired than drunk drivers with blood-alcohol levels exceeding 0.08*. It doesn't matter whether the phone is hand-held or hands free. [Human Factors and Ergonomics Society]

If you put a 20-year-old driver behind the wheel with a cell phone, her reaction times are the same as a 70-year-old driver. But not as wise. [AP Feb 2/05; Human Factors Winter/05]

ELECTRICAL FIELDS AND MAGNETIC FIELDS

"The electricity that comes out of every power socket has associated low frequency electromagnetic fields. Various kinds of higher frequency radiowaves are used to transmit information - whether via TV antennas, radio stations or mobile phone base stations."

"Radio, television, radar and cellular telephone antennas, and microwave ovens are the main sources of RF fields. These fields induce currents within the human body, which if sufficient can produce a range of effects."

"A magnetic field is only produced once a device is switched on and current flows."

Magnetic fields penetrate living tissue "easily."

"Magnetic fields as low as around 2 milligauss or a millionth of a Tesla can produce biological effects. Using a cell phone or a PDA exposes you to magnetic pulses that peak at several tens of microtesla, which is well over the minimum needed to give harmful effects." [Bioeffects Initiative report]

CHILDHOOD LEUKEMIA

"Childhood leukemia is the most frequent childhood malignancy that peaks in the age group of 2 to about 5 years... This peak seems to have been newly evolved in the early quarter of the 20th century and may be due to electrification"... acting as synergistic activators of toxic chemical compounds, I add to the Bioeffects Initiative finding.



MELATONIN, ALZHEIMER'S AND BREAST CANCER

"Melatonin is found in nearly all organisms... it helps prevent both Alzheimer's disease and breast cancer. Long-term exposure to extremely low frequency (ELF, = 60 Hz) magnetic fields is associated with a decrease in melatonin production."

"Amyloid beta protein is generally considered the primary neurotoxic agent causally associated with Alzheimer's disease. Melatonin can inhibit the development of Alzheimer's disease and, thus, low melatonin may increase the risk of Alzheimer's disease."

"Low melatonin production is a likely risk factor for breast cancer... 11 of the 13 published epidemiologic residential and occupational studies are considered to provide (positive) evidence that high MF exposure can result in decreased melatonin production. (The two negative studies had important deficiencies that may certainly have biased the results.)"

"Some modulation patterns are more bioactive than others, for example, frequencies are similar to those found in brain wave patterns. Current public safety limits do not take modulation into account and thus are no longer sufficiently protective of public health where chronic exposure to pulsed or pulse-modulated signal is involved, and where sub-populations of more susceptible individuals may be at risk from such exposures." [Bioeffects Initiative report]

LOW POWER IS VERY DANGEROUS

Cell phone researcher Dr. Peter Franch says unequivocally that brain and other "cells are permanently damaged by cellular phone frequencies." This cellular damage, Franch notes, is maximized at low power. [guardian.co.uk]

Much like taking repeated blows to the head, rapidly pulsing cell phones signal permanent brain damage. And the high frequency range used in today's digital cell phones is also very close to the resonant frequency of human DNA, as well as the resonant frequency of the human skull case.

As the Bioeffects Initiative report points out: "Published laboratory studies have provided evidence for more than 40 years on bioeffects at much lower intensities than cited in the various widely publicized guidelines for limits to prevent harmful effects. Many of these reports show EMF-caused changes in processes associated with cell growth control, differentiation and proliferation which are the molecular and cellular basis of cancer."

"Windows of intensity align across different carrier frequencies." [Bioeffects Initiative report]

COLTAN

A tiny piece of mineral used in your phone called coltan is causing a frenzied rush for its extraction in strip mines across the Congo - exploiting children, razing pristine forests, wiping out up to 90% of all mountain gorillas, and has already led to the rape of more than 250,000 women as old as 75 and girls as young as three.

Since consumers don't have any idea where the coltan in their phones comes from, please stop buying them until guidelines guaranteeing the provenance of cell phone and wireless laptop computers come in.

CONCLUSIONS OF THE BIOEFFECTS INITIATIVE REPORT

"The conclusion that, if health effects of commonly encountered RF exposures exist, they must be small, is wrong. The evidence points to a quite substantial hazard. Scientific research has shown that the public is not being protected from potential damage that can be caused by exposure to EMF, both power frequency (ELF) and radio frequency (RF)."

"There is a need for a biological standard to replace the thermal standard and to also protect against cumulative effects across the EM spectrum."

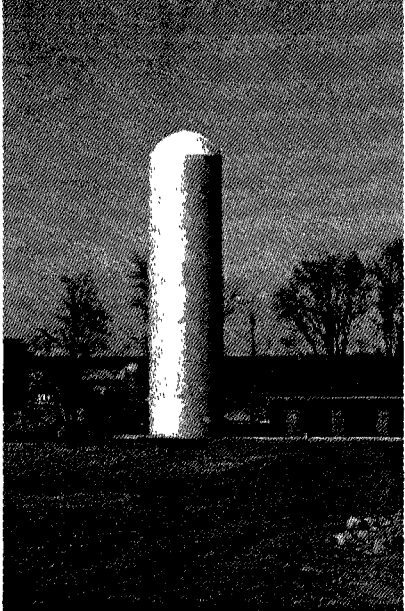
One main conclusion from the worldwide NATO meetings in 2005: "Worldwide harmonization of standards have to be based on biological responses."

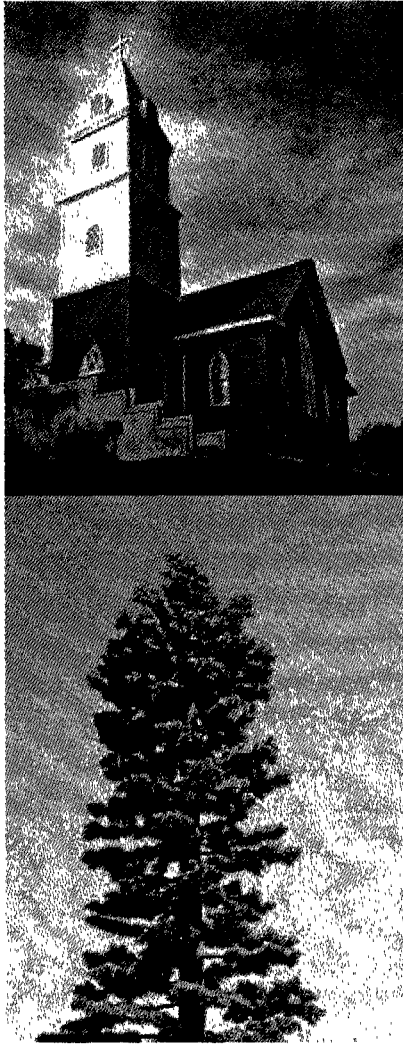
"DNA damage (strand breaks), a cause of cancer, occurs at levels of ELF and RF that are below the safety limits. Also, there is no protection against cumulative effects stimulated by different parts of the EM spectrum."

"ELF limits for public exposure should be revised to reflect increased risk of breast cancer at environmental levels possibly as low as 2 milliGauss or 3 mG."

"There is substantial scientific evidence that some modulated fields (pulsed or repeated signals) are bioactive, which increases the likelihood that they could have health impacts with chronic exposure even at very low exposure levels. Modulation signals may interfere with normal, nonlinear biological processes."

"Current standards have ignored modulation as a factor in human health impacts, and thus are inadequate in the protection of the public in terms of chronic exposure to some forms of ELFmodulated RF signals... The collective papers on modulation appear to be omitted from consideration."





IT'S NOT JUST THE CELL PHONES!

What about all these cell phone relay towers springing up everywhere?

Our bodies - and each one of our trillions of cells - are exquisitely sensitive receiving antennas.

There are currently over 210,000 cell towers, providing 81% wireless penetration in America alone, and one would be hard-pressed to find an inhabitable place on Earth that is not within range of cell frequency transmissions. [CTIA The Wireless Association June/07]

The work of researchers like Dr. Henry Lai, Dr. Ross Adey and Dr. Jerry Phillips show that such effects as DNA strand breaks are produced not only by short-term exposure at high intensity, but also by long-term, chronic exposure to low intensities - like that increasingly experienced by growing numbers of people from cell phone towers and microwave communication facilities.

Henry Lai found Radio Frequency Radiation like that from cell phone towers penetrates further into a child's small, growing skull.

As my friend Chris Anderson points out, "This is continuous exposure, and it is not optional."

Sydney Australia first city to go wireless say a significant jump in allergies and deaths.

By 2005, more than 500 cell tower disputes around the country ended up in court. But federal law

prohibits towns from rejecting a transmission tower on the grounds that it poses health concerns. [New York Times May 1/05]

Now, cell phones small enough to fit inside a cigarette case have decreased reception so base stations must boost their microwave transmissions 15% to 20%. [New York Times Mar 10/03]

Findings by the Associated Bioelectromagnetics Technologists show that RF exposure from cell phones and cell phone relay towers "is wholly correlated with the repeatedly documented increased incidence of autism - now reported by at least some researchers as greater than 1 per 100 newborn."



A COMING CULL?

Professor Khurana has placed his considerable reputation behind warning: "Unless the industry and governments take immediate and decisive steps, the incidence of malignant brain tumours and associated death rate will be observed to rise globally within a decade from now - by which time it may be much too late to medically intervene." [Independent Mar 30/08]

"Dr. George Carlo predicts surefire disaster, and the complete destruction of the health care system from electromagnetic radiation alone." Right now, the Bioeffects Initiative report indicates that as many as one in 10 people suffer debilitating effects from electromagnetic sensitivities. EMR expert Chris Anderson predicts, "In the next 5 to 10 years, fully half the developed world's population could suffer disability from EMR. [Chris Anderson EMR expert - correspondence with the author.]

After carefully reviewing more than 100 clinical studies showing that using "hands free" and regular cell phones for 10 years or more can double the risk of brain cancer, PhD Vini Khurana - who has received 14 awards while publishing more than three dozen scientific papers - predicts that cell phones will kill far more people than either smoking or asbestos. Smoking continues to cull some five million people worldwide every year, while asbestos exposure in England continues to claim as many corpses as road accidents. [Independent Mar 30/08]

In September 2007, the EU's European Environment Agency (EEA) and the country of Germany both issued warnings to their citizens advising them to avoid the use of WiFi and cell phones until further long term studies are conducted, citing fears that the ubiquitous use of wireless technology has the potential to become the next public health disaster on the level of tobacco smoking, asbestos, and lead in automobile gas. [naturalnews.com]

Dr. Vini Khurana urges everyone to stop using cell phones immediately. [Independent Mar 30/08]

GUARANTEED CELL PHONE PROTECTION

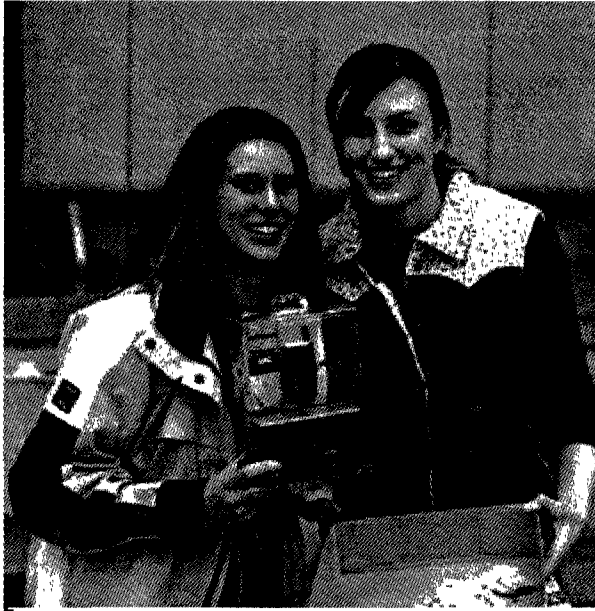
Dr. Gro Harlem Brundtland, director general of the World Health Organisation, former Norwegian prime minister and licensed physician emphasized: *Making shorter calls does not help*, [Microwave News Mar-Apr/02; Dagbladet Norge Mar 9/02]

The only way to ensure complete protection against being turned into a zombie by cell phones is to avoid using them except in emergencies when no other voice communication is available - at the max, experts suggest, one or two minutes per month.



SEVEN THINGS YOU CAN DO

1. Do not use a cell phone for longer than one minute twice a month.
2. Do not live within two miles or five kilometers from a cell phone tower. Get the tower removed. Or move.
3. In your home, *unplug* all electrical appliances when not in use. (Switching TVs and similar devices "off" does *not* turn them off. Intersecting electrical fields result.)
4. Avoid using wireless routers and portable phones.
5. Keep your bedroom free of electrical appliances, especially near your head while you sleep. Use a battery-operated alarm clock - never a plug-in clock radio! Unplug lamps when not in use.
6. Replace dimmer switches with regular switches to eliminate high-frequency radiation - the "dirty electricity" hidden in your home's most likely improperly grounded electrical wiring. (Even if done to Code.)
7. Take the best quality daily vitamin and mineral supplements program you can get your hands on.



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BREAKING! Scientists Launch Urgent Appeal against Cell Phones

February 22, 2011, 4:21 pm

Cellphone Use Tied to Changes in Brain Activity

By TARA PARKER-POPE

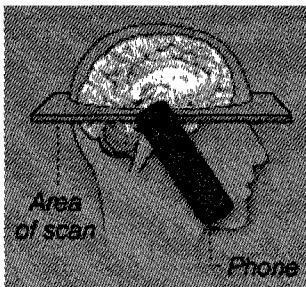
Researchers from the National Institutes of Health have found that less than an hour of cellphone use can speed up brain activity in the area closest to the phone antenna, raising new questions about the health effects of low levels of radiation emitted from cellphones.

The researchers, led by Dr. Nora D. Volkow, director of the National Institute on Drug Abuse, urged caution in interpreting the findings because it is not known whether the changes, which were seen in brain scans, have any meaningful effect on a person's overall health.

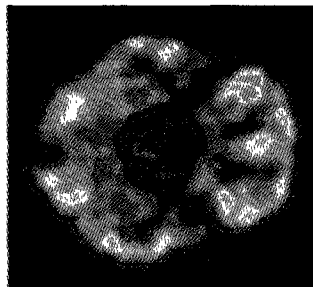
But the study, published Wednesday in The Journal of the American Medical Association, is among the first and largest to document that the weak radio-frequency signals from cellphones have the potential to alter brain activity.

CELLPHONES AND THE BRAIN Researchers tested 47 people by placing a cellphone at each ear. Both phones were off in one test, and in the other test the right phone was on a muted call. After 50 minutes, brain scans showed increased consumption of glucose, or sugar, in areas of the brain near the activated phone.

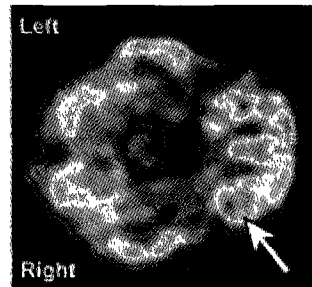
BRAIN SCAN




BOTH CELLPHONES OFF



RIGHT CELLPHONE ON



Rate of brain glucose metabolism LOW  HIGH

Source: JAMA Note: images are from a single participant. THE NEW YORK TIMES, IMAGES BY JAMA

“The study is important because it documents that the human brain is sensitive to the electromagnetic radiation that is emitted by cellphones,” Dr. Volkow said. “It also highlights the importance of doing studies to address the question of whether there are — or are not — long-lasting consequences of repeated stimulation, of getting exposed over five, 10 or 15 years.”

Although preliminary, the findings are certain to reignite a debate about the safety of cellphones. A few observational studies have suggested a link between heavy cellphone use and rare brain tumors, but the bulk of the available scientific evidence shows no added risk. Major medical

groups have said that cellphones are safe, but some top doctors, including the former director of the University of Pittsburgh Cancer Center and prominent neurosurgeons, have urged the use of headsets as a precaution.

Dr. Volkow said that the latest research is preliminary and does not address questions about cancer or other health issues, but it does raise new questions about potential areas of research to better understand the health implications of increased brain activity resulting from cellphone use.

“Unfortunately this particular study does not enlighten us in terms of whether this is detrimental or if it could even be beneficial,” Dr. Volkow said. “It just tells us that even though these are weak signals, the human brain is activated by them.”

Most major medical groups, including the American Cancer Society, the National Cancer Institute and the Food and Drug Administration, have said the existing data on cellphones and health has been reassuring, particularly a major European study released last year by the World Health Organization that found no increased risk of rare brain tumors among cellphone users.

When asked to comment on the latest study, the leading industry trade group, CTIA – The Wireless Association, released a statement emphasizing recent studies that have shown no elevated cancer risk associated with cellphone use.

“The peer-reviewed scientific evidence has overwhelmingly indicated that wireless devices, within the limits established by the F.C.C., do not pose a public health risk or cause any adverse health effects,” said John Walls, vice president of public affairs for the trade group, adding that leading global health groups “all have concurred that wireless devices are not a public health risk.”

But the new research differed from the large observational studies that have been conducted to study cellphone use. In Dr. Volkow’s study, the researchers used brain scans to directly measure how the electromagnetic radiation emitted from cellphones affected brain activity..

The randomized study, conducted in 2009, asked 47 participants to undergo positron emission tomography — or PET — scans, which measure brain glucose metabolism, a marker of brain activity. Each study subject was fitted with a cellphone on each ear and then underwent two 50-minute scans.

During one scan, the cellphones were turned off, but during the other scan, the phone on the right ear was activated to receive a call from a recorded message, although the sound was turned off to avoid auditory stimulation.

Whether the phone was on or off did not affect the overall metabolism of the brain, but the scans did show a 7 percent increase in activity in the part of the brain closest to the antenna. The finding was highly statistically significant, the researchers said. They said the activity was unlikely to be associated with heat from the phone because it occurred near the antenna rather than where the phone touched the head.

In the past, any concerns about the health effects of cellphones have been largely dismissed because the radiofrequency waves emitted from the devices are believed to be benign. Cellphones emit nonionizing radiation, waves of energy that are too weak to break chemical bonds or to set off the DNA damage known to cause cancers. Scientists have said repeatedly that there is no known biological mechanism to explain how nonionizing radiation might lead to cancer or other health problems.

But the new study opens up an entirely new potential area of research. Although an increase in brain glucose metabolism happens during normal brain function, the question is whether repeated artificial stimulation as a result of exposure to electromagnetic radiation might have a detrimental effect.

Although speculative, one theory about how an artificial increase in brain glucose metabolism could be harmful is that it could potentially lead to the creation of molecules called free radicals, which in excess can damage healthy cells. Or it may be that repeated stimulation by electromagnetic radiation could set off an inflammatory response, which studies suggest is associated with a number of health problems, including cancer.

Among cancer researchers and others interested in the health effects of cellphones, the study, listed in the medical journal under the heading “Preliminary Communications,” was met with enthusiasm because of the credibility of the researchers behind it and the careful methods used.

“It’s a high-quality team, well regarded, and if nothing else they’re showing that radiation is doing something in the brain,” said Louis Slesin, editor of Microwave News, a newsletter on the health effects of electromagnetic radiation. “The dogma in the cellphone community says that it doesn’t do anything. What she’s shown is that it does do something, and the next thing to find out is what it’s doing and whether it’s causing harm.”

Dr. Ronald B. Herberman, former director of the Pittsburgh Cancer Institute and now chief medical officer for the Intrexon Corporation, a biotechnology company in Germantown, Md., said, “I think it’s a very well-designed study, and they have clearly shown that there is biologic activity being induced in the nerve cells in the region where the antenna is the closest.” Dr. Herberman said skeptics about the risks of cellphones have focused on the fact that the type of radiation they emit is too weak to break chemical bonds and cannot plausibly be implicated in cancer. However, the new research suggests a potentially different pathway for cancer and other health problems to develop.

“I think it’s an important new direction to go in for biologists to start delving deeper into sorting out what might be going on,” Dr. Herberman said.

In an editorial accompanying the Journal article, Henry C. Lai, a University of Washington professor of bioengineering who has long raised concerns about cellphone safety, said he hoped the data would broaden the focus of cellphone research and health.

“The bottom line is that it adds to the concern that cellphone use could be a health hazard,” said Dr. Lai. “Everybody is worried about brain cancer, and the jury is still out on that question.”

There are actually quite a lot of studies showing cellphone radiation associated with other events, like sleep disturbances. But people have not been paying a lot of attention to these other types of studies.”

Dr. Volkow said future research may even show that the electromagnetic waves emitted from cellphones could be used to stimulate the brain for therapeutic reasons. She said the research should not set off alarms about cellphone use because simple precautions like using a headset or earpiece can alleviate any concern.

“It does not in any way preclude or decrease my cellphone utilization,” she said.